

294-120PCT-US sequence listing
 SEQUENCE LISTING

<110> de Groot, Ronald
 Hermans, Peter Wilhelmus Maria

<120> Pneumococcal Vaccines

<130> Docket 294-120 PCT/US

<140> US 10/049,473

<141> 2002-02-12

<150> PCT/NL00/00569

<151> 2000-08-14

<150> EP 99202640.1

<151> 1999-08-13

<160> 5

<170> PatentIn version 3.1

<210> 1

<211> 966

<212> DNA

<213> Streptococcus pneumoniae

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 agcatgaaag gggatgtcat tacagaacat caattttatg agcaagtga aagcaaccct 180
 tcagcccaac aagtcttggt aaatatgacc atccaaaaag tttttgaaaa acaatatggc 240
 tcagagcttg atgataaaga ggttgatgat actattgccg aagaaaaaaa acaatatggc 300
 gaaaactacc aacgtgtctt gtcacaagca ggtatgactc ttgaaacacg taaagctcaa 360
 attcgtacaa gtaaattagt tgagttggca gttaagaagg tagcagaagc tgaattgaca 420
 gatgaagcct ataagaaagc ctttgatgag tacactccag atgtaacggc tcaaattcatc 480
 cgtcttaata atgaagataa ggccaaagaa gttctcgaaa aagccaaggc agaagggtgct 540
 gattttgctc aattagccaa agataattca actgatgaaa aaacaaaaga aaatggtgga 600
 gaaattacct ttgattctgc ttcaacagaa gtacctgagc aagtcaaaaa agccgctttc 660
 gcttttagatg tggatggtgt ttctgatgtg attacagcaa ctggcacaca agcctacagt 720
 agccaatatt acattgtaaa actcactaag aaaacagaaa aatcatctaa tattgatgac 780
 tacaaagaaa aattaaaaac tgttatcttg actcaaaaac aaaatgattc aacatttggt 840
 caaagcatta tcggaaaaga attgcaagca gccaatatca aggttaagga ccaagccttc 900
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<210> 2

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<211> 322

<212> PRT

<213> Streptococcus pneumoniae

<400> 2

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Gly Ala Ile Thr Leu Leu Ser Val Ala Thr Leu Ala Ala Cys Ser Lys
 20 25 30

Gly Ser Glu Gly Ala Asp Leu Ile Ser Met Lys Gly Asp Val Ile Thr
 35 40 45

Glu His Gln Phe Tyr Glu Gln Val Lys Ser Asn Pro Ser Ala Gln Gln
 50 55 60

Val Leu Leu Asn Met Thr Ile Gln Lys Val Phe Glu Lys Gln Tyr Gly
 65 70 75 80

Ser Glu Leu Asp Asp Lys Glu Val Asp Asp Thr Ile Ala Glu Glu Lys
 85 90 95

Lys Gln Tyr Gly Glu Asn Tyr Gln Arg Val Leu Ser Gln Ala Gly Met
 100 105 110

Thr Leu Glu Thr Arg Lys Ala Gln Ile Arg Thr Ser Lys Leu Val Glu
 115 120 125

Leu Ala Val Lys Lys Val Ala Glu Ala Glu Leu Thr Asp Glu Ala Tyr
 130 135 140

Lys Lys Ala Phe Asp Glu Tyr Thr Pro Asp Val Thr Ala Gln Ile Ile
 145 150 155 160

Arg Leu Asn Asn Glu Asp Lys Ala Lys Glu Val Leu Glu Lys Ala Lys
 165 170 175

Ala Glu Gly Ala Asp Phe Ala Gln Leu Ala Lys Asp Asn Ser Thr Asp
 180 185 190

Glu Lys Thr Lys Glu Asn Gly Gly Glu Ile Thr Phe Asp Ser Ala Ser
 195 200 205

Thr Glu Val Pro Glu Gln Val Lys Lys Ala Ala Phe Ala Leu Asp Val
 210 215 220

Asp Gly Val Ser Asp Val Ile Thr Ala Thr Gly Thr Gln Ala Tyr Ser
 225 230 235 240

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Lys Lys Val Ser Glu Ser Gln Leu Lys Ala Val Trp Lys Thr Tyr Gln
 130 135 140

Pro Lys Val Thr Val Gln His Ile Leu Thr Ser Asp Glu Asp Thr Ala
 145 150 155 160

Lys Gln Val Ile Ser Asp Leu Ala Ala Gly Lys Asp Phe Ala Thr Leu
 165 170 175

Ala Lys Thr Asp Ser Ile Asp Thr Ala Thr Lys Asp Asn Gly Gly Lys
 180 185 190

Ile Ser Phe Glu Ser Asn Asn Lys Thr Leu Asp Ala Thr Phe Lys Asp
 195 200 205

Ala Ala Tyr Lys Leu Lys Asn Gly Asp Tyr Thr Gln Thr Pro Val Lys
 210 215 220

Val Thr Asn Gly Tyr Glu Val Ile Lys Met Ile Asn His Pro Ala Lys
 225 230 235 240

Gly Thr Phe Thr Ser Ser Lys Lys Ala Leu Thr Ala Ser Val Tyr Ala
 245 250 255

Lys Trp Ser Arg Asp Ser Ser Ile Met Gln Arg Val Ile Ser Gln Val
 260 265 270

Leu Lys Asn Gln His Val Thr Ile Lys Asp Lys Asp Leu Ala Asp Ala
 275 280 285

Leu Asp Ser Tyr Lys Lys Pro Ala Thr Thr Asn
 290 295

<210> 4

<211> 299

<212> PRT

<213> Lactococcus lactis lactis

<400> 4

Met Lys Lys Lys Met Arg Leu Lys Val Leu Leu Ala Ser Thr Ala Thr
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Ala Leu Leu Leu Leu Ser Gly Cys Gln Ser Asn Gln Thr Asp Gln Thr
 20 25 30

Val Ala Thr Tyr Ser Gly Gly Lys Val Thr Glu Ser Ser Phe Tyr Lys
 35 40 45

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Glu Leu Lys Gln Ser Pro Thr Thr Lys Thr Met Leu Ala Asn Met Leu
 50 55 60

Ile Tyr Arg Ala Leu Asn His Ala Tyr Gly Lys Ser Val Ser Thr Lys
 65 70 75 80

Thr Val Asn Asp Ala Tyr Asp Ser Tyr Lys Gln Gln Tyr Gly Glu Asn
 85 90 95

Phe Asp Ala Phe Leu Ser Gln Asn Gly Phe Ser Arg Ser Ser Phe Lys
 100 105 110

Glu Ser Leu Arg Thr Asn Phe Leu Ser Glu Val Ala Leu Lys Lys Leu
 115 120 125

Lys Lys Val Ser Glu Ser Gln Leu Lys Ala Ala Trp Lys Thr Tyr Gln
 130 135 140

Pro Lys Val Thr Val Gln His Ile Leu Thr Ser Asp Glu Asp Thr Ala
 145 150 155 160

Lys Gln Val Ile Ser Asp Leu Ala Ala Gly Lys Asp Phe Ala Met Leu
 165 170 175

Ala Lys Thr Asp Ser Ile Asp Thr Ala Thr Lys Asp Asn Gly Gly Lys
 180 185 190

Ile Ser Phe Glu Leu Asn Asn Lys Thr Leu Asp Ala Thr Phe Lys Asp
 195 200 205

Ala Ala Tyr Lys Leu Lys Asn Gly Asp Tyr Thr Gln Thr Pro Val Lys
 210 215 220

Val Thr Asp Gly Tyr Glu Val Ile Lys Met Ile Asn His Pro Ala Lys
 225 230 235 240

Gly Thr Phe Thr Ser Ser Lys Lys Ala Leu Thr Ala Ser Val Tyr Ala
 245 250 255

Lys Trp Ser Arg Asp Ser Ser Ile Met Gln Arg Val Ile Ser Gln Val
 260 265 270

Leu Lys Asn Gln His Val Thr Ile Lys Asp Lys Asp Leu Ala Asp Ala
 275 280 285

Leu Asp Ser Tyr Lys Lys Leu Ala Thr Thr Asn
 290 295

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<210> 5

<211> 299

<212> PRT

<213> Lactococcus lactis cremoris

<400> 5

Met Lys Lys Lys Met Arg Leu Lys Val Leu Leu Ala Ser Thr Ala Thr
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 20 25 30

Val Ala Thr Tyr Ser Gly Gly Lys Val Thr Glu Ser Ser Leu Tyr Lys
 35 40 45

Glu Leu Lys Gln Ser Pro Thr Thr Lys Thr Met Leu Ala Asn Met Leu
 50 55 60

Ile Tyr Arg Ala Leu Asn His Ala Tyr Gly Lys Ser Val Ser Thr Lys
 65 70 75 80

Thr Val Asn Asp Ala Tyr Asp Ser Tyr Lys Gln Gln Tyr Gly Glu Asn
 85 90 95

Phe Asp Ala Phe Leu Ser Gln Asn Gly Phe Ser Arg Ser Ser Phe Lys
 100 105 110

Glu Ser Leu Arg Thr Asn Phe Leu Ser Glu Val Ala Leu Lys Lys Leu
 115 120 125

Lys Lys Val Ser Glu Ser Gln Leu Lys Ala Ala Trp Lys Thr Tyr Gln
 130 135 140

Pro Lys Val Thr Val Gln His Ile Leu Thr Ser Asp Glu Asp Thr Ala
 145 150 155 160

Lys Gln Val Ile Ser Asp Leu Ala Ala Gly Lys Asp Phe Ala Met Leu
 165 170 175

Ala Lys Thr Asp Ser Ile Asp Thr Ala Thr Lys Asp Asn Gly Gly Lys
 180 185 190

Ile Ser Phe Glu Leu Asn Asn Lys Thr Leu Asp Ala Thr Phe Lys Asp
 195 200 205

Ala Ala Tyr Lys Leu Lys Asn Gly Asp Tyr Thr Gln Thr Pro Val Lys
 210 215 220

Val Thr Asp Gly Tyr Glu Val Ile Lys Met Ile Asn His Pro Ala Lys

